ORA

Special Technical Report

Netbook - A Toolset in Support of a

Collaborative Learning

ODYSSEY RESEARCH ASSOCIATES

This material is based upon work supported by the
Defense Advanced Research Projects Agency

Special Technical Report

Netbook - A Toolset in Support of a
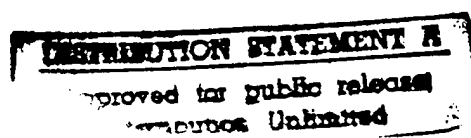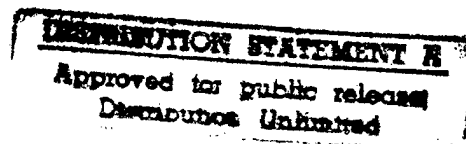
Collaborative Learning

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ORA

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DTIC-OC
Defense Technical Information Center
Cameron Station
Alexandria, VA 22304-6145

Re: Contract No. MDA972-96-C-0004

In compliance with the requirements of the subject contract, enclosed are
two copies each of the following documents:

Deliverable Number	Document Title
0002AB	Special Technical Report Netbook - A Toolset in Support of a Collaborative Learning
0002AD	Final Technical Report Netbook - A Toolset in Support of a Collaborative Learning
0002AE	Netbook User's Guide and Installation Manual

Please contact me if you should have any questions.

Sincerely,

Pamela Daly
Contracts Administrator

mf
enc.

Sent via: **US Mail**

Abstract

As part of its collaborative efforts on the project "Netbook—A Toolset in Support of a Collaborative and Cooperative Learning Environment," the Interactive Multimedia Group (IMG) at Cornell University conducted a usability test of the latest version of Netbook, developed by Odyssey Research Associates (ORA) in Ithaca, New York. Cornell's goal was to test the concepts and current functionality of the Netbook software, which is designed to help users take greater advantage of the Internet by allowing them to retrieve and organize visual and textual information from web sites. The purpose of the testing and evaluation was to examine current progress, content, and functionality of Netbook. During early November, 1996, a team of IMG researchers reviewed Netbook after an introductory demonstration by an ORA programmer. Once trained, the leaders then demonstrated the site and software to the test-users in a group session. They first summarized the features and use of the material, then repeated the demonstration in a more detailed presentation. Users were encouraged to comment and discuss reactions during this stage. The reviewers considered the overall presentation and design, as well as the individual features paying specific attention to the following attributes:

- Appeal
- Navigation and operation
- Comprehensibility
- Responsiveness
- Features
- Application
- Contents

Each test-user was given a survey designed to gather their reactions to the software. Specific recommendations are described in this document. In general test-users are encouraged by the goal of the tool to organize and make sense out of the wealth of information on the World Wide Web. They are especially supportive of the annotations feature.

Table of Contents

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1. Summary

This document describes the methods, results, and conclusions of a formative usability test conducted on the Netbook system. The goal of the testing was to examine the functionality of the current system in order to inform further design and development decisions. Netbook is a software development/research project being conducted for the DARPA computer aided training initiative (CEATI). As a part of the SNAIR division of CAETI, Netbook concerns itself with the management of Internet resources. More specifically, Netbook is a toolset that allows students, teachers, and administrators to navigate the World Wide Web, collect resources found there, index and annotate those resources, and then organize them in a meaningful way. In addition Netbook provides the capacity for communication with peers and teachers, enabling students to collaborate while engaged in the aforementioned activities. The purpose of the testing and evaluation was to examine current progress, content, and functionality of Netbook as it existed independent of a particular domain of application. IMG researchers reviewed Netbook paying specific attention to particular attributes. These attributes include appeal, navigation and operation , comprehensibility, responsiveness, features, and application. The reviewers considered the overall presentation and design, as well as the individual features. Each test-user completed a survey the results of which were combined and analyzed. Among the recommendations several general changes should be explored: distinguishing many of the Netbook features from Netscape's features; structuring paradigms alternative to the traditional heirarchy; and tailor the application for the domain within which it will be applied. In general test-users are encouraged by the goal of the tool to organize and make sense out of the wealth of information on the World Wide Web. They are especially supportive of the annotations feature.

2. Introduction

As part of its collaborative efforts on the project "Netbook—A Toolset in Support of a Collaborative and Cooperative Learning Environment," the Interactive Multimedia Group (IMG) at Cornell University recently conducted a user test of the latest version of the Netbook software, developed by Odyssey Research Associates (ORA) in Ithaca, New York. This evaluation complemented similar IMG activities designed to implement models of user-centered design in order to maximize the usability and efficacy of computer-mediated communication tools.

Cornell's goal was to test the concepts and current functionality of the Netbook software, which is designed to help users take greater advantage of the Internet by allowing them to retrieve and organize visual and textual information from web sites.

3. Methods, Assumptions, and Procedures

During early November, 1996, a team of IMG researchers reviewed Netbook after an introductory demonstration by an ORA programmer. The research team, assembled and directed by Dr. Geri Gay (Director of the IMG and Associate Professor, Communication), included:
- Dr. Deborah Trumbull (Associate Professor, Science Education & Evaluation)
- Elena Dubrovsky (Interface Specialist)
- Robert Rieger (Coordinator, IMG)
- Phil Barrett (Computer Programmer)
- Wendy Martin (Doctoral Student, Communication)
- Amanda Sturgill (Doctoral Student, Communication).

Evaluation Goal
The goal of the testing and evaluation was to examine current progress, content, and functionality of Netbook. The reviewers considered the overall presentation and design, as well as the individual features and the following attributes:
- Appeal
- Navigation and operation
- Comprehensibility

- Responsiveness
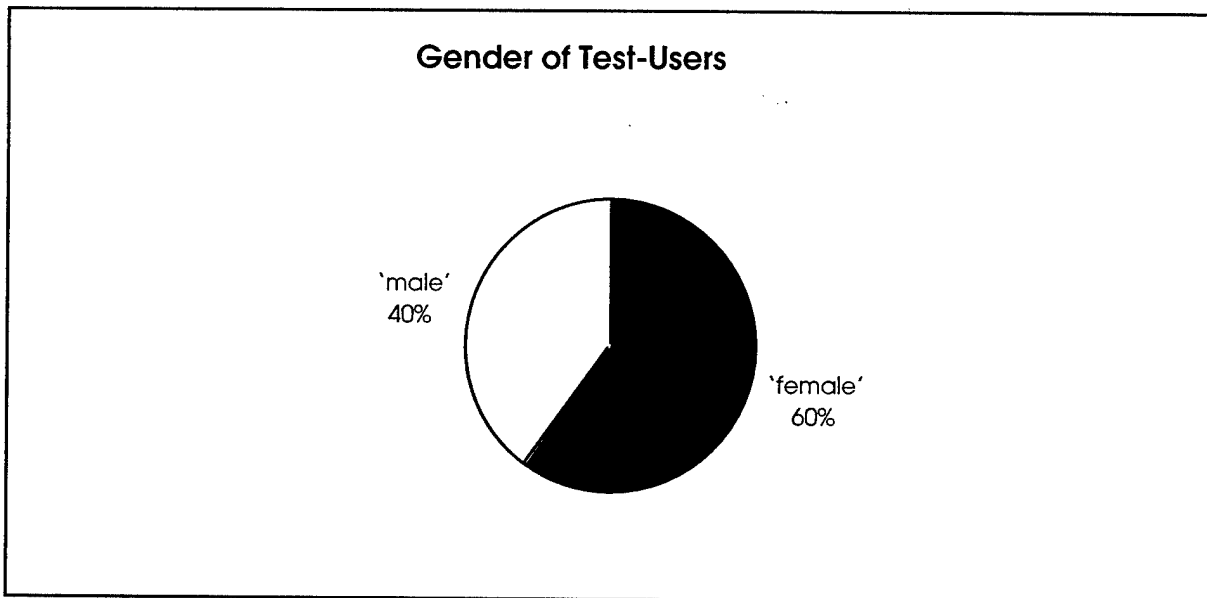- Features
- Application
- Contents

Review Protocol
The reviewers organized their evaluation in three parts:
1) Leader training
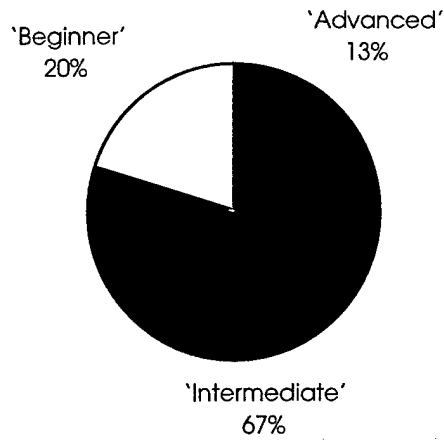2) Team demonstration
3) Individual evaluation

Immediately after the software and site instructions arrived from our ORA collaborators, a programmer, designer, and evaluation specialist began learning the software. The leaders then met to plan an evaluation scenario and to discuss the material features. It was determined that the software was not yet ready for a comprehensive end-user test, and that a limited review among a small pool of test-users would be the most beneficial strategy at this stage.

Once trained, the leaders then demonstrated the site and software to the test-users in a group session. They first summarized the features and use of the material, then repeated the demonstration in a more detailed presentation. Users were encouraged to comment and discuss reactions during this stage.

Each test-user was given a survey (Appendix A) designed to gather their reactions to the software. Test-users are profiled in the charts below.

Gender of Test-Users

'male' 40%

'female' 60%

Test-Users' Level of Computer Expertise

'Beginner'
20%

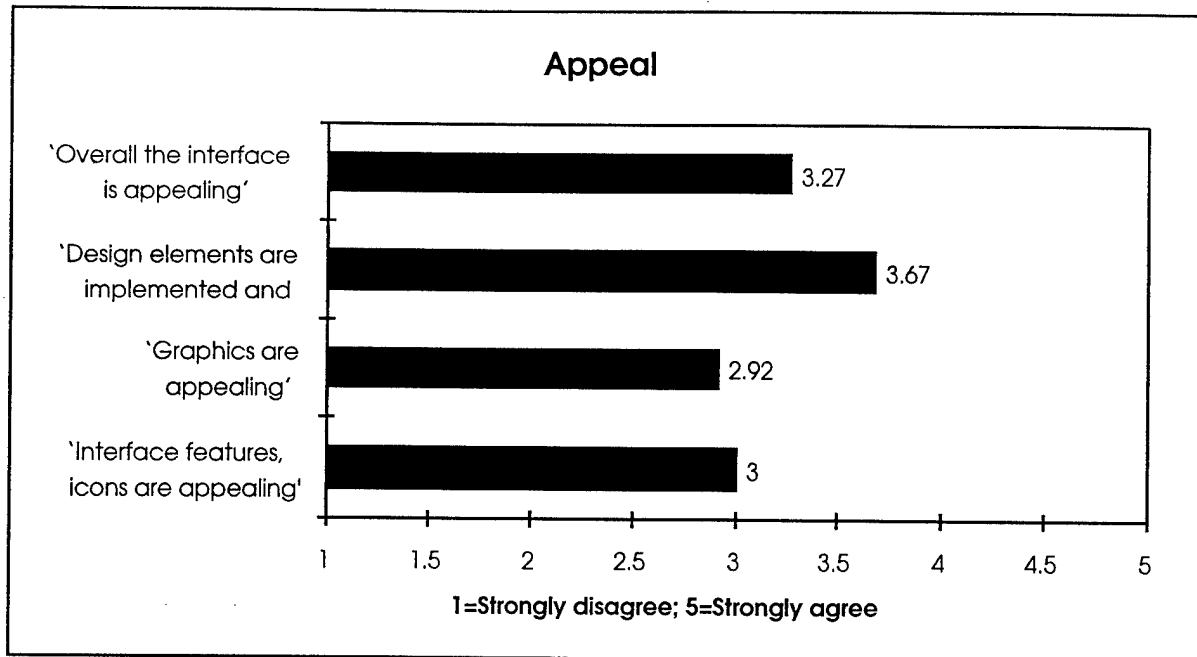'Advanced'
13%

'Intermediate'
67%

4.   Results and Discussions

Overall Impression

In general test-users are encouraged by the goal of the tool to organize and make sense out of the wealth of information on the World Wide Web. They are especially supportive of the annotations feature.
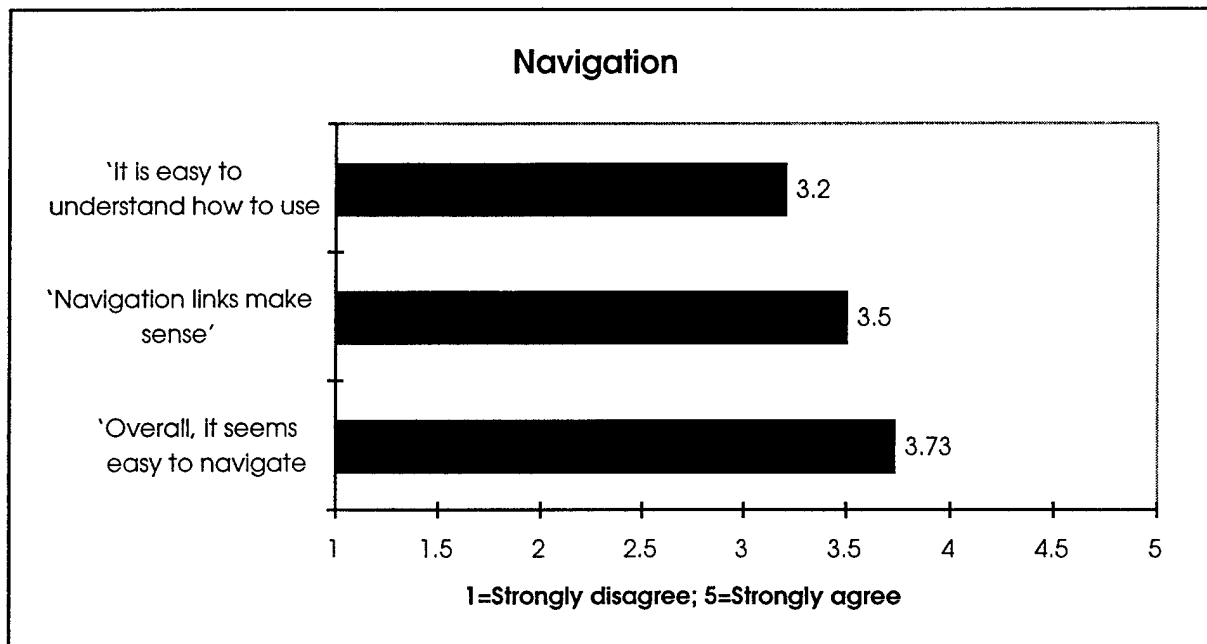
I. Appeal

Appeal

'Overall the interface is appealing'	3.27
'Design elements are implemented and	3.67
'Graphics are appealing'	2.92
'Interface features, icons are appealing'	3

1=Strongly disagree; 5=Strongly agree

Please suggest ideas to make the Netbook more appealing:

•More color; I like the Eudora icon images.
•Higher contrast! Icons are too small/dull. "Forth" is a poor choice for "Forward" function.
•The icons are too clear--difficult to read.
•Better browser, more ability to grab text graphics as opposed to all or nothing
•The interface is appealing. Need to make opening screen easier to understand.
•A little tricky to tell what you use where.
•It looks pretty standard and functional -- the big problem is small size of screen for the outline.
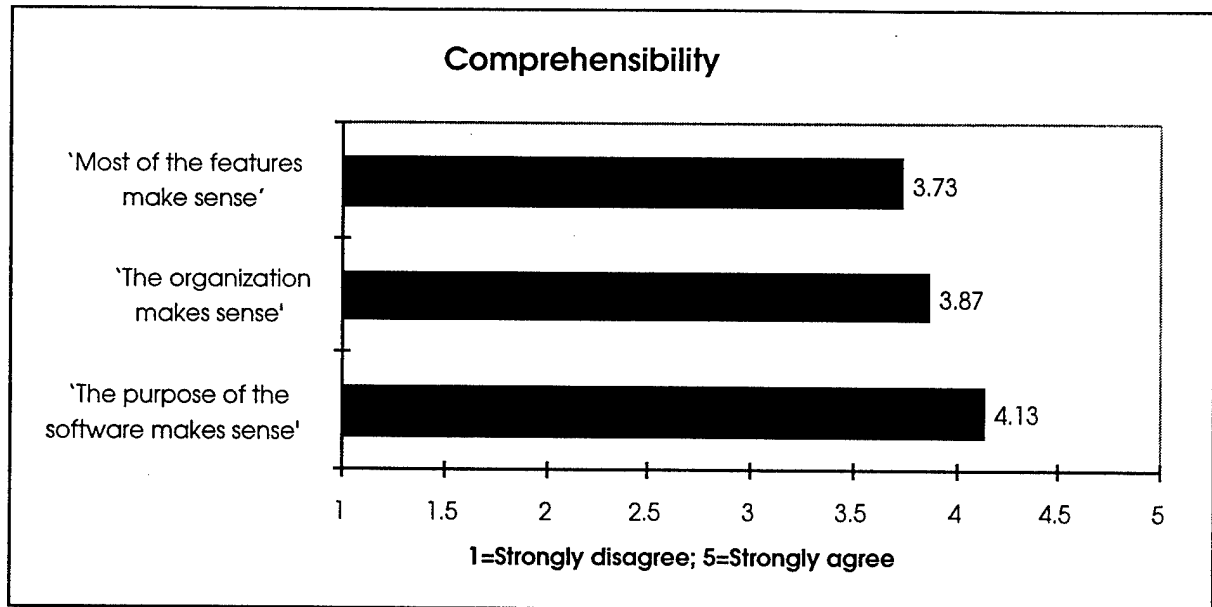•Like the resize function

4

II. Navigation

Navigation

'It is easy to understand how to use — 3.2

'Navigation links make sense' — 3.5

'Overall, It seems easy to navigate — 3.73

1=Strongly disagree; 5=Strongly agree

Please suggest ideas for making the Netbook easier to navigate:

•You need a control to open the browser window instead of relying on user to drag right side of window. There is no help. What does "save" do? (Save this page or the repository?)

•The history list talks about pages with a "+". What do >, * and - mean?

•How do you know at the begining that you need to drag the window to the right to see the web page? An "autosave" feature would be very useful. It would be important to keep some of the features of Netscape, like "netsearch and "what's new".

•Use the right button to display a context-sensitive pop-up menu of commands. How can I archive just one image I see on a page? How can I save a paragraph of text I might see on a page? There is no cut and paste to allow me to grab a paragraph and put it into my word processor (or an annotation!) Are pages archived permanently on disk or kep in a volatile cache? I'm not sure that "Project Repository" is a good label (under File/New). Maybe just "Repository", or "Archive".

•Seems like it is intuitive for experienced users. Some kind of introduction or help would be useful for novices.

•Better representation of relations between folders, when not hierarchical. one you fiddle with the buttons it make a bit of sense

•Obtuse difficult to understand what to do, what is available, etc.

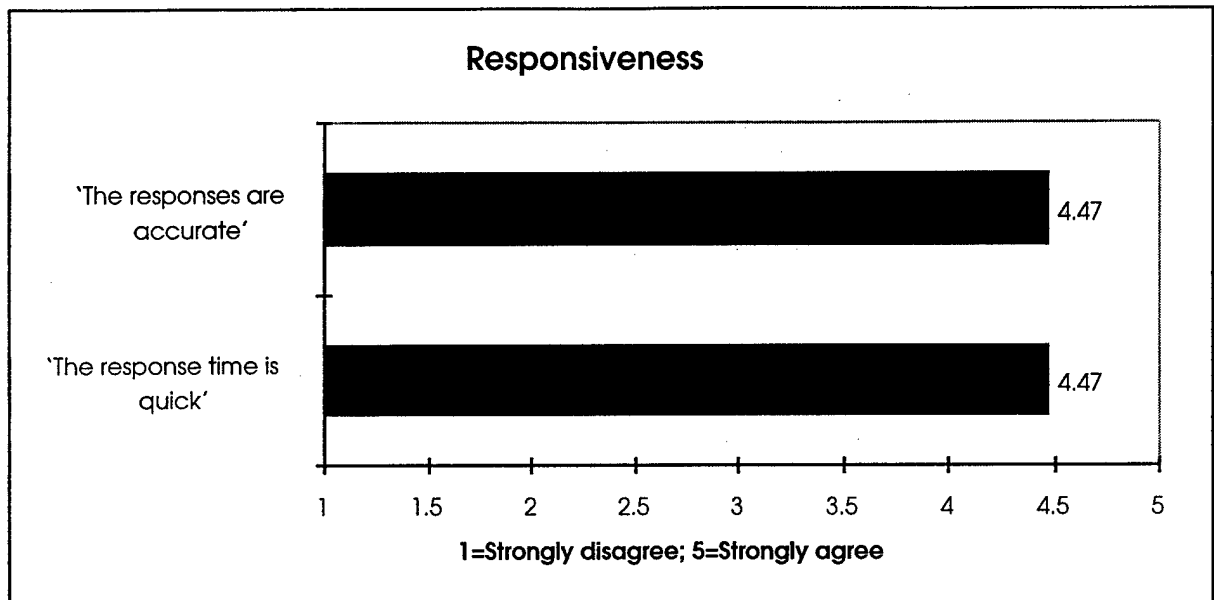•Need something to let you know that you drag the web page into the folder.

III. Comprehensibility

Comprehensibility

Statement	Rating
'Most of the features make sense'	3.73
'The organization makes sense'	3.87
'The purpose of the software makes sense'	4.13

1=Strongly disagree; 5=Strongly agree

Please suggest ideas for making the Netbook easier to understand:

•It only appears to be a slightly more advanced "bookmark" feature
•Aside from the option to make notes, what is the difference between this and the boomarks. The organization of the Web pages? Could you possibly check the information saved without being online?
•I think it is fairly understandable
•nothing new-- I can do most of this already in Netscape.
•The "links" and "graphics" collection is unclear.
•Hard to differentiate it from stuff that is available elsewhere.
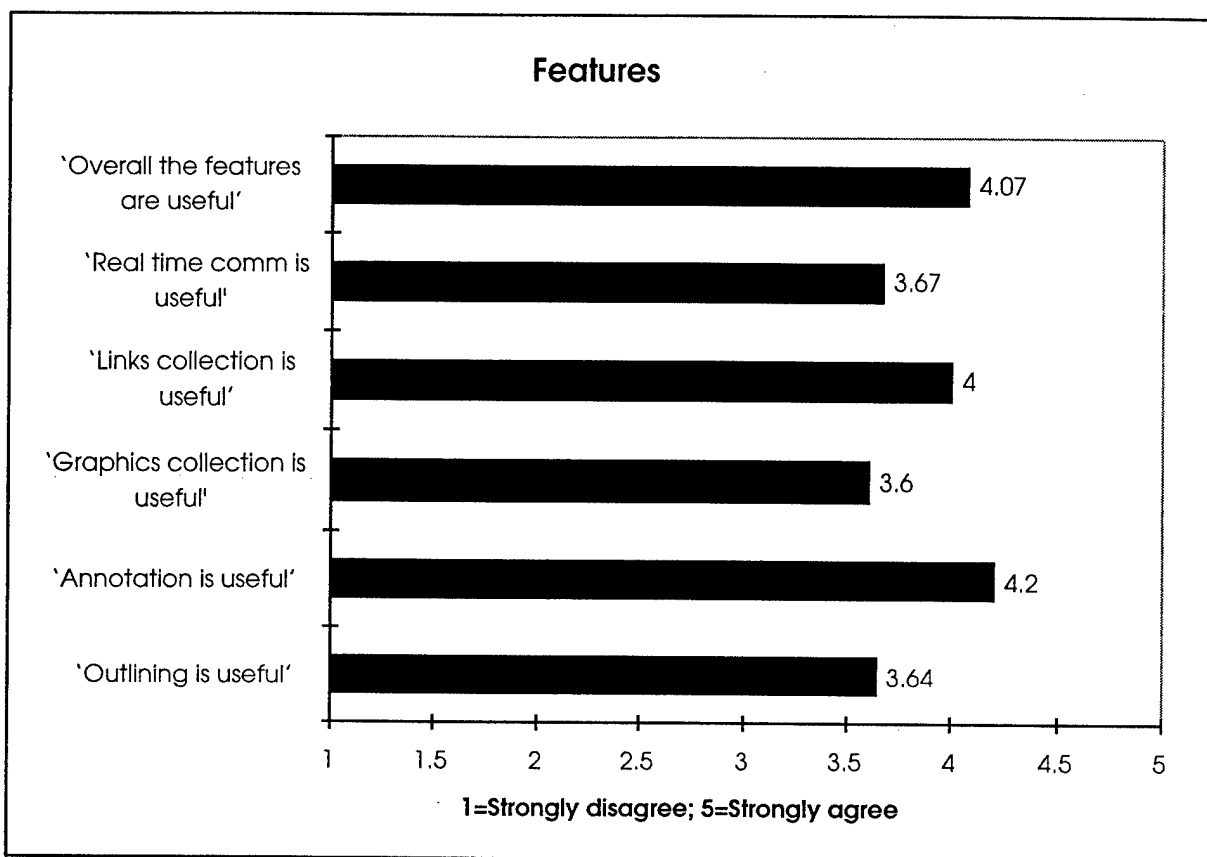•opening at beginning, ability to move notebook off main page

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IV. Responsiveness

Responsiveness

'The responses are accurate' — 4.47

'The response time is quick' — 4.47

1=Strongly disagree; 5=Strongly agree

Please suggest ideas for making the Netbook more responsive:

•Seems OK based on our demonstration
•Allow the user to save pages before the page loads. Save "pages" by dragging links to the page without opening the page.
•Stop crashing. it seems to crash on large sites.
•Frequent crashes are disconcerting -- appears that there are still memory allocation problems.
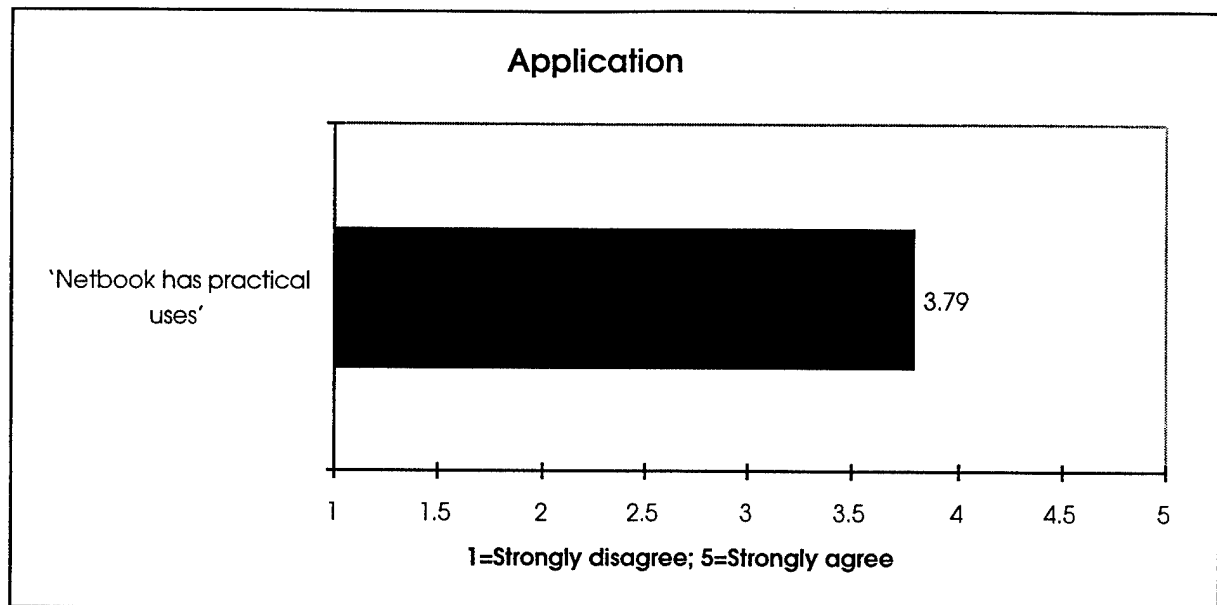•have to wait for pages to load

V. Features

Features

Statement	Rating
'Overall the features are useful'	4.07
'Real time comm is useful'	3.67
'Links collection is useful'	4
'Graphics collection is useful'	3.6
'Annotation is useful'	4.2
'Outlining is useful'	3.64

1=Strongly disagree; 5=Strongly agree

What features of Netbook are the most interesting and useful?

•Ability to save own notes and search results.
•Repositories
•The possibility to add notes.
•I like how it is able to save the links and graphics separately.
•Annotation and real-time communication
•Annotation could be very useful for research
•Can't see the promise of "graphics collection" and "links collection," "real-time communication" feature is too small. Can't selectively collect some material but not others.
•Will chat feature have audio? Will I be able to see my collaborators mouse pointer if we are looking at the same page? Can I keep my web page from being moved/changed by my collaborator? Will the white board support WYSIWYG html?
•Unclear how to use "outlining" feature, "real-time communication" feature did not work. features are useful but cite
•Graphics collector

What feature enhancements might we consider for Netbook?

•Setting up a search function under the annotation feature.
•Search function among links, graphics, annotations I've collected; comprehensive history list, not just one path.
•Search annotations; Show snapshot of page on icon by putting first XX# lines in a very low resolution graphic which is then put in the directory.
•Can I publish my repositories on the web? Can I compose new web pages, especially dynamically if I am collaborating on the net.
•Some organizing system other than an outline would be helpful. An outline, with limited space, quickly gets confusing. Hard to recal all the features in the outline as you fill up the scree segment. It's not helpful as a way to organize the material collected.
•It would be really useful if one could access the notes without being online -- retrieve those notes and incorportate them to the word processor where you are writing your paper.
•I think that pulling a few graphics at the same time from a page should be an option, not just one at a time.
•better editing control, all or nothing *sucks*
•The communication like sounds good, but I'd have to be persuaded or reminded to use it.
use stronger browsers, don't duplicate Netscape features.
•12 feature future
•graphics that are links
•You should be able to grab and save the HTML documents.

VI. Application

Application

'Netbook has practical uses' ███████████████ 3.79

1   1.5   2   2.5   3   3.5   4   4.5   5

1=Strongly disagree; 5=Strongly agree

In what ways, if any, do you see yourself using Netbook for personal or professional applications?

•Netscape + Bookmarks seem to be able to do most, if not all, of Netbook
•If I could search annotations, quite useful for organizing URL's.
•Organizing booksmarks; creating sites of hot links
•I would not buy it. Certainly the bookmarks from the traditional netscape work well for me. I would be more interested if I could have a notebook at one side of the screen where I could write notes, paste ideas from the the web page that I could use later and then be able to incorporate those notes into a word processing software.
•Archiving bookmark repositories
•5-application
•Personal, I do think that this is much better than bookmarks since you can orgnize your pages.
•Organizational tool
•I don't. I'll stick with Netscape.
•Good way to collect and organize data.
•In its present form, not much advantage over Bookmarks.
•Similar to other programs at this point
•Good when hunting through web for interesting web pages to share with class

In what ways, if any, do you see others using Netbook?

•Exchanging bookmark repositories.
•I think that many would find netbook very useful for organization and easy access.
•Students gathering and organizing information for class projects/papers.
•Hard to say for high school -- there's a problems with authority of information from the web.
•Maybe heavy web browsers who like getting info from various sites. Not tho for poeple who want to organize the material into a new kind of organizational structure.
collaboration
•Good way for web page designers to find and save links for their own page + use graphics from other pages (which could be a problem)

5. Conclusions

Overall comments on this prototype:

•Personally, I can't see that I would purchase this software (or take the time to download) since the basics of Netbook are currently available on Netscape.

•I can do almost everything currently implemented in Netbook with the current version of Netcape, but there are a lot of features in Netscape which are missing from Netbook. It seems to be a very simplistic program, there would have to be more linkages, eg email to make it attractive to use.

•I like it.

•Maybe you really want to make a java applet to implement (just) the new stuff. A product like this has extreme risk of being obsolete.

•Would like to learn more about Netbook.

•Interesting, but fails to break new ground. Seems like the wheel is being re-invented.

•There are some good ideas here, but the overall look and feel are not very inviting. I'm having a hard time distinguishing this from current browsers.

•Has promise with annotations. A more flexible way of organizing would be useful.

•The overall flash is impressive, but after expliring, its utility isn't clear. Putting together collection of graphics or links or addresses is ok, but doesn't allow for any customizing or synthesis.

•Unstable but has some interesting ideas

•Not all that different from bookmarks except its ability to save graphics, and it can be more organized than bookmarks.

6. Recommendations

1) Further define the audience or audiences to be served by this software. This decision will guide all other design and programming decisions.

2) Consider design enhancements that add a unique look and feel to Netbook.

3) Consider incorporating a more detailed introduction to the software, including information about the Netbook project itself: its purpose, goals, audience, and structure.

4) Consider adding more and consistent options within the software that demonstrate navigation, links and structure.

5) Consider ways to clarify for the user the linkages between the browser and the outlining function.

6. The software should use a lower level language such as C or C++ for development, as opposed to a higher level scripting language like VisualBasic. Using a language like C++ gives the programmer greater control of the program and may help resolve some of the other interface and usability issues.

7. The memory allocation problem needs to be fixed to prevent crashes.

8. The software should be able to save work during operation; in the prototype Netbook, if the system crashed, the work was lost.

9. When users perform a function, they need feedback from the software that the function is being executed. (Status bar during searching or set cursor to busy icons.)

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10. Error messages should be more understandable.

11. The ability to highlight and save small or large sections of text or graphics easily.

12. Outliner should be more intuitive and flexible.

13. A collaboration feature that gives the user the option to share the "information in your database so that others could use it, or . . . to keep it private." Also, the option to keep selected contents private.

14. The ability to access another user's organizer structure to use as a "template."

15. For collaborative research endeavors, the ability to search other users' databases. After a key word is entered, the software could "automatically search through some type of database that others were searching . . ."

16. The ability to alphabetize the outliner organizer.

17. Intuitive "copy and paste" procedures.

18. A "chat room" feature for collaborating with others at the same school.

7. References

8. Appendices

Netbook Evaluation Survey

Check one: _____female _male
Level of computer expertise _____Advanced _____Intermediate _Beginner

After reading the question, please select from the set of responses below, and/or make comments considering each point.

      5= Strongly agree
      4=Agree
      3=Neutral
      2=Disagree
      1=Strongly disagree

      N/A = Does not apply

Overall Impressions

I. Appeal

(Please use rating numbers from scale above.)

☐   Interface features (icons, etc.) are appealing.

☐   Graphics are appealing.

☐   Design elements are implemented and maintained consistently.

☐   Overall the interface is appealing.

Please suggest ideas to make the Netbook more appealing:

II. Navigation and operation

(Please use rating numbers from scale above.)

☐   Overall, it seems easy to navigate through the interface.

☐   Navigation links make sense.

☐   It is easy to understand how to use the software.

Please suggest ideas for making the Netbook easier to navigate:

III. Comprehensibility

☐ The purpose of the software makes sense.

☐ The organization of information makes sense.

☐ Most of the features make sense.

Please suggest ideas for making the Netbook easier to understand:

IV. Responsiveness

☐ The response time is quick.

☐ The responses are accurate.

Please suggest ideas for making the Netbook more responsive:

V. Features

☐ The "outlining" feature is useful.

☐ The "annotation" feature is useful.

☐ The "graphics collection" feature is useful.

☐ The "links collection" feature is useful.

☐ The "real-time communication" feature is useful.

☐ Overall, the features are useful.

What features of Netbook are the most interesting and useful?

What feature enhancements might we consider for Netbook?

VI. Application

☐   Netbook has practical uses.

In what ways, if any, do you see yourself using Netbook for personal or professional applications?

In what ways, if any, do you see others using Netbook?

VII. Summary

Overall comments on this prototype: